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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/842,047      | 04/26/2001  | Yasuo Fukuda         | Q64291              | 6518             |

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|                    |              |
|--------------------|--------------|
| EXAMINER           |              |
| ALEXANDER, TAMRA D |              |
| ART UNIT           | PAPER NUMBER |
| 3729               |              |

DATE MAILED: 12/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

S.M

|                              |                             |                  |
|------------------------------|-----------------------------|------------------|
| <b>Office Action Summary</b> | Application N .             | Applicant(s)     |
|                              | 09/842,047                  | FUKUDA ET AL.    |
|                              | Examiner<br>Tamra Alexander | Art Unit<br>3729 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 04/26/01.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) 1-3 and 8-24 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 4-7 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 26 April 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

|                                                                                                            |                                                                             |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 1-3 and 8-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made without traverse in Paper No. 6.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: Method of Forming a Projection Electrode.

3. The abstract of the disclosure is objected to because generic terminology is not provided for "DF" in line 2. Correction is required. See MPEP § 608.01(b).

4. "DF3" should be replaced with "DF 3" on page 10 line 14 and every subsequent occurrence should be corrected.

5. "(S1)" should be replaced with "(step S1)" on page 9 line 20. Similar corrections should be made to S2 through S13 where the word "step" is not already present.

### ***Claim Objections***

Claims 5-7 are objected to because of the following informality. Appropriate correction is required:

6. "A method" should be changed to "The method" in line 1 of claims 5-7.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The following are just some examples of indefinite limitations in claims 4-7. All indefinite limitations require correction.

7. The claim 4 is generally narrative and indefinite, failing to conform with current U.S. practice. It appears to be a literal translation into English from a foreign document and is replete with grammatical and idiomatic errors. Lines 4-6 recite the limitation, "masking a non-etching portion including a portion forming a tapering bump of the electrode pattern formed at this step". Examiner is unclear as to the meaning of this limitation.

8. In claim 4, the limitation "this step" in lines 6 and 8 lacks antecedent basis. Examiner is unclear as to which step applicant is referring to (forming an electrode pattern; forming a mask pattern; etching the electrode pattern; or eliminating the mask pattern).

9. In claims 5 and 7, line 2, the limitation, "the step of forming a plated layer" lacks antecedent basis.

10. In claims 5 and 7, lines 3-4, the limitation, "the mask pattern-eliminated electrode pattern" lacks antecedent basis.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4-7, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,105,537, Datta et al in view of the prior art disclosed in the instant application, hereinafter referred to as applicant-admitted prior art (AAPA).

Datta teaches the formation of a mask pattern for masking a non-etching portion of an electrode pattern, etching the electrode pattern, and forming a tapering bump (conical projection) in column 5 lines 14-19, column 6 lines 13-22 and Figure 2. Datta also teaches a wet etching step utilizing a corrosion action of an etching solution (column 5 lines 14-19, and column 6 lines 25-35). Finally, Datta teaches the formation of a plated layer on the mask pattern-eliminated electrode pattern (finished cones) in column 7 lines 8-13.

Datta discloses the benefits of using tapered bumps (cone connectors) on electrode patterns present on wiring boards in column 1 lines 20-24 and lines 39-46. However, Datta fails to disclose forming an electrode pattern on a wiring board.

AAPA discloses forming an electrode pattern on a wiring board for providing electrical contact on top of a circuit board (page 1 lines 17-20 and Prior Art Figure 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Datta and AAPA in order to form the tapered electrodes on patterned electrodes on a wiring board.

12. Alternatively, Claims 4-7, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art disclosed in the instant application, hereinafter referred to as applicant-admitted prior art (AAPA) in view of US Patent 5,105,537, Datta et al.

AAPA discloses forming an electrode pattern on a wiring board for providing electrical contact on top of a circuit board (page 1 lines 17-20 and Prior Art Figure 15). The teachings of AAPA disclose all of the limitations of the claimed invention except for the formation of tapered bumps on the electrode pattern.

Datta teaches the formation of tapering bumps (conical projections) by masking and wet etching (column 5 lines 14-19, column 6 lines 13-22 and 25-35 and Figure 2). Datta also teaches the formation of

a plated layer on the tapered bumps (finished cones) in column 7 lines 8-13. Further, Datta discloses the benefits of using tapered bumps (cone connectors) on electrode patterns on wiring boards are to lower the cost and raise the performance of the electrical contacts (column 1 lines 20-24 and lines 39-42).

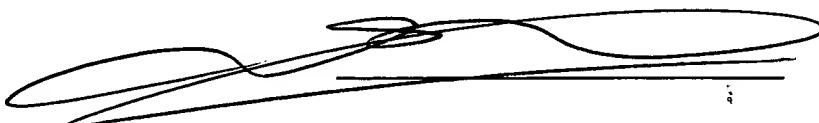
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of AAPA and Datta in order to form the tapered electrodes on patterned electrodes on a wiring board.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamra Alexander whose telephone number is 703.305.0831. The examiner can normally be reached on Monday through Friday, 7:30am - 4:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703.308.1789. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9302 for regular communications and 703.872.9303 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.1148.

TA  
December 16, 2002



PETER VO  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700